Upper cervical instability in Down's syndrome:
A Case Report

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Although spinal manipulation is a safe procedure, the chiropractor should always be alert for contraindications to his treatments. A case of Down's syndrome is presented in which gross instability of the upper cervical spine exists. Its diagnosis by x-ray examination, a discussion of the role of the vertebral artery, and comments on the importance of a proper examination in cases such as these, concludes the paper.

The incidence of iatrogenic trauma following spinal manipulative therapy is rare, especially when one considers the number of spinal adjustment delivered (1). Nonetheless, it is mandatory that the chiropractic practitioner be aware of those factors that are contraindications to certain adjustive procedures.

This is of particular importance in our treatment of the upper cervical spine. Agenesis or rupture of the transverse ligament, agenesis or fracture of the odontoid and anatomical variations in the calibre or relationships of the vertebral artery are but some of the factors to be excluded before manipulation can be safely applied.

The following case presentation concerns a patient with Down's syndrome, a disorder not frequently seen in a chiropractor's office.

We must be aware, however, of the spinal problems peculiar to this condition, and conduct our examination and treatment accordingly.

Case report

A 22-year-old female with Down's syndrome, presented to my office with a 2 year history of neck pain. The pain was described as an ache in the lower cervical spine bilaterally, with the occasional sharv "kink" in the suboccipital area on movement. She was an avid swimmer, but found that turning her head to breathe not only caused a sharp suboccipital pain at the time, but also left her with a diffuse ache in the whole cervical spine for a few days thereafter. Flexion of the head also aggravated the pain, and headaches had recently seemed to accompany the neck problem. A deep heating rub applied to the cervical area seemed to provide relief. There was no history of trauma.

Examination revealed a small, slight female of stated age in apparent good health. Cervical flexion and extension caused mild suboccipital discomfort, but the other ranges of motion were full and painfree. Motion palpation showed marked fixation at the occiput-C1, and C2-3 levels on flexion. Rotary fixations were noted at C3 bilaterally. Compression testing caused suboccipital pain, whereas manual traction was painfree. The deep tendon reflexes were within normal limits (++) but sensory examination with a pinwheel revealed hyperalgesia in the C7 dermatome on the left. The modified Adson's manoeuvre for vertebrobasilar insufficiency was normal bilaterally.

An x-ray motion study was undertaken (Figures 1-4). A marked increased in the atlanto-dental interval was noted on the lateral films. The neutral lateral view revealed an ADI of 5 mm (Figure 2); the flexion film an ADI of 6 mm (Figure 3); and the extension film an ADI of 1 mm (Figure 4). The diagnosis of atlantal-axial hypermobility due to agenesis of the transverse ligament was made.

With this diagnosis in mind, cervical manipulation was avoided. Treatment instead consisted of upper dorsal adjustments and mild trigger point therapy in the cervical spine. After seven treatments, the patient was painfree.

Suggestions on changing her swimming stroke so as to avoid extreme cervical rotation were given, and she was directed to forego certain of her daily yoga exercises.

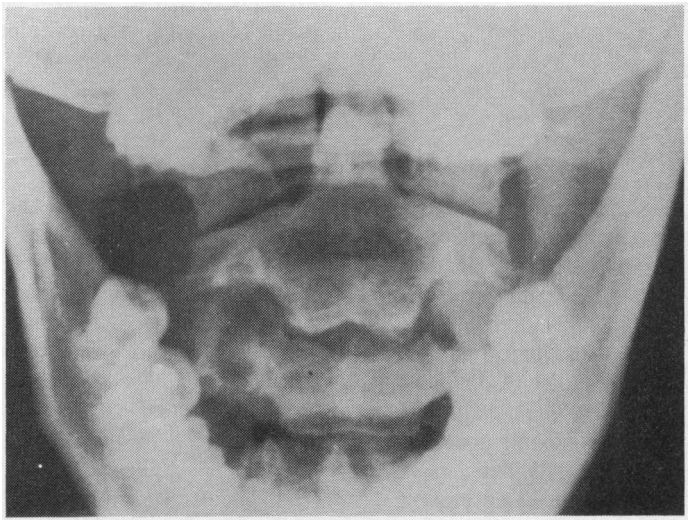

Figure 1: The A-P open mouth view does not suggest the gross instability in this area.

Discussion

As high as 50% of all cases of Down's syndrome may present with agenesis of the transverse ligament (1), the ligament that binds the dens to the anterior arch of the atlas. Other conditions that may affect the integrity of this ligament include traumatic insult, and inflammatory rupture of the ligament as a result of either various arthritides or a recent upper respiratory streptococcal infection.

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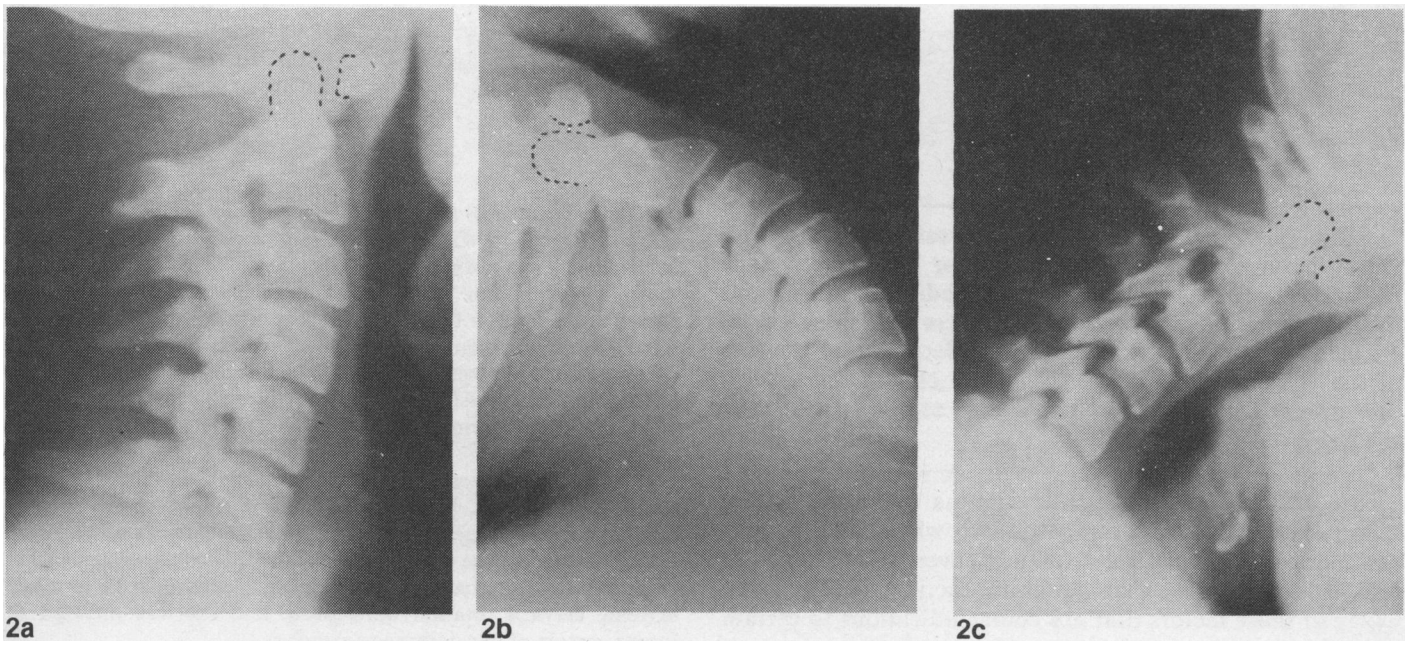

Figure 2a: The lateral cervical view (neutral position). Measurement revealed an ADI of 5mm; **2b:** the lateral cervical view (extended position). Measurement revealed an ADI of 1mm; **2c:** the lateral cervical view (flexed position). Measurement revealed an ADI of 6mm.

The effect of this instability on the vertebral arteries, the arteries supplying the brain stem, cerebellum and posterior cerebrum, must then be considered. The atlantal hypermobility compromises the patency of the vertebral artery at this level as the additional anterior drift of the lateral masses on flexion causes traction deformation in the artery at this point (1,3). Any attempt to manipulate this area could be met with the drastic consequence (1,3) of a vertebro-basilar occlusion, severely reducing blood flow to the circle of Willis.

Flexion and extension lateral x-ray views of the cervical spine as described by Grice (4), Henderson (3), and Korbelas and Henderson (5) will help to assess the stability of the upper cervical area. The normal atlanto-dental interval in the adult is 1 - 2 mm (6), whereas in children the range is 1 - 4 mm (7). Any deviation in excess of these measurements should be considered a contraindication to manipulation in that area.

Conclusions

Spinal manipulation, when delivered by a trained chiropractor, is a safe and effective therapeutic procedure. Physical and spinal examination procedures coupled with the judicious use of xray will cause the infrequent contraindications to our therapy to come to our attention.

Assessing the atlanto-dental interval should become a routine procedure on all of our lateral cervical films, and this is especially important in cases of Down's syndrome. Failure to have done such in this case could have had fatal results.

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